Solid Waste Inventory
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Solid Waste - Recycling

This section helps students understand the complexities of recycling.

	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
1	Does your school recycle? If so, what does it recycle?	Work with the local recycling center or solid waste coordinator to create a recycling program appropriate for your school. The goal of the recycling program should be a 20% annual increase in volume recycled over the initial inventory until 100% recycling is achieved. Conduct research on opportunities for receiving income from recycling in your school. Present you findings to the Site Based Council.	Site for recycling lesson plans, recycling thematic units, and recycling activities. http://www.theteachersguide.com/Recyclinglessonplans.htm Waste reduction assistance for Bluegrass Kentucky PRIDE's 18 county district. http://www.kentuckypride.com Waste reduction assistance for the 38 counties in eastern Kentucky PRIDEs service area http://www.kypride.org/ On line resources: School Recycling Guide, The Marketplace: for Recycling Commodities, Annual Report, Recycling Facilities by County. http://www.waste.ky.gov Master list of recycling and disposal. http://www.metrokc.gov/dnr/kidsweb/master_list.htm Aluminum can recycling. http://www.cancentral.com Gives examples and descriptions of items that have been salvaged by recycling. http://www.moifa.org/exhibitions/past/recycledreseen/soundpage.html Resource on plastic recycling. http://www.plastics.org/s_plastics/index.asp	Primary PL- EP-3.1.4 Students will identify consumer actions (reusing, reducing, recycling) that impact the environment. DOK 1 PL-EP-3.1.5 Students will identify the available health and safety agencies in a community that provide services: Health department Fire department Sanitation Police SS-EP-1.1.1 Students will identify the basic purposes of local government (to establish order, provide security and accomplish common goals); give examples of services local governments provide (e.g., police and fire protection roads and snow removal, garbage pick-up,) and identify how they pay for these services taxes). Fourth Grade PL-04-3.1.4 Students will identify and describe consumer actions (reusing, reducing, recycling) that impact the environment. DOK 2 PL-04-3.1.5 Students will identify and explain the available health and safety agencies in a community that provide services: Health department Fire department Sanitation Police SS-04-1.1.1 Students will describe the basic purposes of Kentucky government (to establish order, provide security and accomplish common goals); give examples of the services that state governments provide (e.g., state police, state highways, state parks, public schools) and identify how the government of Kentucky pays for these services (e.g.,
2	What percentage of your school's classrooms and offices participate in recycling?			
3	Does your school provide recycling containers as well as garbage containers in all areas of the school grounds?			
4	Where is the main storage area for your school's recyclables?			
5	Who is responsible for managing recyclable materials?			
6	Where do recyclables go after they leave the school?			
7	How much income does your school receive from recycling? OR How much does your school pay as a recycling fee?			

				sales taxes, state income taxes). Fifth Grade PL-05-3.1.4 Students will describe consumer actions (reusing, reducing, recycling) and identify ways these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste). DOK 2 PL-05-3.1.5 Students will identify and describe the available health and safety agencies in a community that provide services: Health department Fire department Sanitation Police Ambulance services SS-05-1.1.1 Students will describe the basic purposes of the U.S. Government as defined in the Preamble to the U.S. Constitution (to establish justice, to ensure domestic tranquility, to provide for the common defense, to promote the general welfare, to secure the blessings of liberty); give examples of services the U.S. Government provides (e.g., armed forces, interstate highways, national parks) and analyze the importance of these services to citizens today. Sixth Grade PL-06-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 Seventh Grade PL-07-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 Eighth Grade PL-08-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2

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				High School PL-HS-3.1.4 Students will compare consumer actions (reuse, reduce, recycle, choosing renewable energy sources, using biodegradable packaging materials, composting) and analyze how these actions impact the environment (e.g., conserving resources; reducing water, air, and land pollution; reducing solid waste; conserving energy).

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Solid Waste – Trash Disposal

This section makes students more aware of how much trash they generate and how it is disposed.

	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
8	How full are trash dumpsters when emptied?	Become a trash detective. Find out how much trash your school produces each year. How much does the school pay to dispose of its trash. How much could the school save if the amount of trash was reduced by 10%. By 25%. Do the same detective work for the school district. Present your findings to the principal.	Kentucky Division of Waste Management (On line resources: School Recycling Guide, The Marketplace: for Recycling Commodities, Annual Report, Recycling Facilities by County) http://www.waste.ky.gov/ Solid Waste Coordinators by county http://www.waste.ky.gov/branches/rla/County+Solid+Waste+Coordinators.htm Local Recycling Centers http://eppcapps.ky.gov/DWM%20Recycling/default.aspx	Primary MA-EP-1.3.1 Students will analyze real-world problems to identify appropriate representations using mathematical operations, and will apply operations to solve real-world problems with the following constraints: add and subtract whole numbers with three digits or less; multiply whole numbers of 10 or less; add and subtract fractions with like denominators less than or equal to four and add and subtract decimals related to money. DOK 2 PL- EP-3.1.4 Students will identify consumer actions (reusing, reducing, recycling) that impact the environment. DOK 1 PL-EP-3.1.5 Students will identify the available health and safety agencies in a community that provide services: Health department Fire department Sanitation Police SS-EP-1.1.1 Students will identify the basic purposes of local government (to establish order, provide security and accomplish common goals); give examples of services local governments provide (e.g., police and fire protection roads and snow removal, garbage pick-up,) and identify how they pay for these services taxes). Fourth Grade MA-04-1.3.1 Students will analyze real-world problems to identify appropriate representations using mathematical operations, and will apply operations to solve real-world problems with the following constraints: add and subtract whole numbers with four digits or less; multiply whole numbers with two digits or less;
9	How much trash is discarded during the school year?			
10	What percentage (by volume or weight) of the waste stream is each item on the inventory sheet? A. Paper/cardboard B. Metal can (aluminum, steel, tin) C. Electronics/Hazardous Waste D. Food E. Grounds Waste (leaves, branches, grass clippings) F. Plastic (and other synthetics like Styrofoam) G. Glass			
11	Where does the trash go when it leaves the school?			
12	Who picks up the trash?			

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13	What is the school's annual cost for trash pickup?			divide whole numbers with three digits or less by single-digit divisors (with or without remainders); add and subtract fractions with like denominators less than or equal to 10 and add and subtract decimals through hundredths. DOK 2 PL-04-3.1.4 Students will identify and describe consumer actions (reusing, reducing, recycling) that impact the environment. DOK 2 PL-04-3.1.5 Students will identify and explain the available health and safety agencies in a community that provide services: Health department Fire department Sanitation Police SS-04-1.1.1 Students will describe the basic purposes of Kentucky government (to establish order, provide security and accomplish common goals); give examples of the services that state governments provide (e.g., state police, state highways, state parks, public schools) and identify how the government of Kentucky pays for these services (e.g., sales taxes, state income taxes). Fifth Grade MA-05-1.3.1 Students will analyze real-world problems to identify appropriate representations using mathematical operations, and will apply operations to solve real-world problems with the following constraints: add, subtract, multiply, and divide whole numbers (less than 100,000,000), using technology where appropriate; add and subtract fractions with like denominators through 16, with sums less than or equal to one and add and subtract decimals through hundredths. DOK 2 PL-05-3.1.4 Students will describe consumer actions (reusing, reducing, recycling) and identify ways these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste). DOK 2 PL-05-3.1.5 Students will identify and describe the available health and safety agencies in a community that provide services: Health department Fire department

				Sanitation Police Ambulance services SS-05-1.1.1 Students will describe the basic purposes of the U.S. Government as defined in the Preamble to the U.S. Constitution (to establish justice, to ensure domestic tranquility, to provide for the common defense, to promote the general welfare, to secure the blessings of liberty); give examples of services the U.S. Government provides (e.g., armed forces, interstate highways, national parks) and analyze the importance of these services to citizens today. Sixth Grade MA-06-1.3.1 Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations to simplify numerical expressions. DOK 2 PL-06-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 Seventh Grade MA-07-1.3.1 Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions. DOK 2 PL-07-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 Eighth Grade MA-08-1.3.1 Students will add, subtract, multiply and divide rational numbers to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions. DOK 2

				PL-08-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 High School MA-HS-1.3.1 Students will solve real-world and mathematical problems to specified accuracy levels by simplifying expressions with real numbers involving addition, subtraction, multiplication, division, absolute value, integer exponents, roots (square, cube) and factorials. PL-HS-3.1.4 Students will compare consumer actions (reuse, reduce, recycle, choosing renewable energy sources, using biodegradable packaging materials, composting) and analyze how these actions impact the environment (e.g., conserving resources; reducing water, air, and land pollution; reducing solid waste; conserving energy).

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Solid Waste – Composting

This section teaches several concepts about the life cycle and ecosystems.

	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
14	Does your school compost yard waste?	Develop a plan in which your school will compost 25% of the compostable waste next year. Ask your groundskeepers to help you design and carry out the plan. Include how to use the compost on the school grounds	Bluegrass PRIDE has resource materials to assist with classroom or enrichment activity. http://www.kentuckypride.com Web site for King County, Seattle, Washington. Has several excellent waste management activities such as "Composting: Worm Recycling". http://www.metrokc.gov/dnrp/swd/elementaryschool/documents/reuse.pdf "The Great Lunch Dilemma" and "Trash Tracing" help students investigate lunch trash. http://www.lalc.k12.ca.us/target/units/recycle/activities/activity4.html Compost Magic: The Composting Handbook. http://www.gnb.ca/0009/0372/0003/0001-e.html The Compost Learning Guide http://www.stanslaughter.com The How To's of Composting http://www.vegweb.com/composting/ Soil Biology Classroom Activities: "Earthworm Farm", "How Fast Does it Rot", and "What Lives in the Soil". http://soils.usda.gov/sqi Excellent brochure, "Home Composting". http://cwmi.css.cornell.edu/smallscalecomposting.htm	Primary SC-EP-3.4.4 Students will describe a variety of plant and animal life cycles to understand patterns of the growth, development, reproduction and death of an organism. Plants and animals have life cycles that include the beginning of life, growth and development, reproduction and death. The details of a life cycle are different for different organisms. Observations of different life cycles should be made in order to identify patterns and recognize similarities and differences. DOK 2 SC-EP-3.4.2 Students will understand that things in the environment are classified as living, nonliving and once living. Living things differ from nonliving things. Organisms are classified into groups by using various characteristics (e.g., body coverings, body structures). Fourth Grade SC-04-3.4.2 Students will understand that things in the environment are classified as living, nonliving and once living. Living things differ from nonliving things. Organisms are classified into groups by using various characteristics (e.g., body coverings, body structures). Fifth Grade SC-05-4.7.1 Students will: • describe and categorize populations of organisms according to the function they serve in an ecosystem (e.g., producers, consumers, decomposers); • draw conclusions about the effects of changes to populations in an ecosystem. Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers because they make their own food. All animals, including humans, are consumers, and obtain their food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers and decomposers in an ecosystem. Using data gained
15	Does your school compost food service waste?			
16	Where is (or could be) a compost site located on school grounds?			
17	How is school generated compost used?			
18	How much does your school spend annually on mulch and fertilizer?			
19	Does your community sponsor any programs relating to composting?			

				from observing interacting components within an ecosystem, the effects of changes can be predicted. DOK 3 Sixth Grade SS-06-4.4.4 Students will explain how individual and group perspectives impact the use of natural resources (e.g., urban development, recycling) in the present day. Seventh Grade SC-07-4.7.1 Students will compare abiotic and biotic factors in an ecosystem in order to explain consequences of change in one or more factors. The number of organisms an ecosystem can support depends on the resources available and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition). Given adequate biotic and abiotic resources and no diseases or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem. DOK 3 SC-07-4.6.4 Students will describe or represent the flow of energy in ecosystems, using data to draw conclusions about the role of organisms in an ecosystem. For most ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism in food webs. DOK 3 Eighth Grade SC-08-4.6.5 Students will: • describe the relationships between organisms and energy flow in ecosystems (food chains and energy pyramids); • explain the effects of change to any component of the ecosystem. Energy flows through ecosystems in one direction from photosynthetic organisms to herbivores to carnivores and decomposers. DOK 2

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				High School SC-HS-4.6.4 Students will: • describe the components and reservoirs involved in biogeochemical cycles (water, nitrogen, carbon dioxide and oxygen); • explain the movement of matter and energy in biogeochemical cycles and related phenomena. The total energy of the universe is constant. Energy can change forms and/or be transferred in many ways, but it can neither be created nor destroyed. Movement of matter between reservoirs is driven by Earth's internal and external sources of energy. These movements are often accompanied by a change in physical and chemical properties of the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water as dissolved carbon dioxide and in all organisms as complex molecules that control the chemistry of life. SC-HS-4.7.2 Students will: • evaluate proposed solutions from multiple perspectives to environmental problems caused by human interaction; • justify positions using evidence/data. Human beings live within the world's ecosystems. Human activities can deliberately or inadvertently alter the dynamics in ecosystems. These activities can threaten current and future global stability and, if not addressed, ecosystems can be irreversibly affected. DOK 3

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Solid Waste – Reduce, Reuse, Rebuy

This section addresses such subjects as packaging and consumerism.

	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
20	Does your school and/or school system purchase or use items made with recycled materials?	Identify at least ten items, which the school could purchase from recycled materials. Find a supplier for these materials and compare prices. Share the list with the Principal. Develop and implement and educational plan to reduce paper usage in your school by 10%. Plan and carry out a waste free lunch day in which students and staff aim at bringing lunches that do not produce solid waste. Have such a day at least once a semester. Try having five "waster free lunch days" during Earth Week.	Integrated unit of Nevada Solid Waste Disposal. Can be easily adapted for Kentucky classrooms. http://ofcn.org/cyber.serv/academy/ace/sci/cecsci/cecsci079.html Environmental Awareness Contract. Excellent web site for a variety of science topics. http://scifiles.larc.nasa.gov/educators/ Items for displays on recycling http://www.waste.ky.gov Provides education, training, and technical assistance to start and operate a reuse program. http://www.redo.org The website for King County, Seattle, Washington has several excellent waste management activities. "Plan a Waste Free Lunch" http://www.metrokc.gov./dnrp/swd/elementaryschool/documents/reuse.pdf "Waste Free Lunch Day" http://www.mobot.org/gatewaycenter/ Sample letters to families, information on trash audits, classroom activities, and success stories. http://www.wastefreelunches.org/ Solid Waste Coordinators by county http://www.waste.ky.gov/branches/rla/County+Solid+Waste+Coordinators.htm Local Recycling Centers http://eppcapps.ky.gov/DWM%20Recycling/default.aspx	Primary PL- EP-3.1.4 Students will identify consumer actions (reusing, reducing, recycling) that impact the environment. DOK 1 PL-EP-3.1.1 Students will identify the difference between wants and needs as it relates to consumer decisions. Fourth Grade PL-04-3.1.4 Students will identify and describe consumer actions (reusing, reducing, recycling) that impact the environment. DOK 2 PL-04-3.1.1 Students will explain the difference between wants and needs as it relates to consumer decisions. Fifth Grade PL-05-3.1.4 Students will describe consumer actions (reusing, reducing, recycling) and identify ways these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste). DOK 2 PL-05-3.1.1 Students will explain the difference between wants and needs as it relates to consumer decisions.
21	Does your school purchase supplies in: A. quantities large enough to reduce packaging waste? B. reduced/recycled packaging?			
22	Does your school have a policy for the reduction of paper usage (e.g., electronic record storage, use of email, printing on both sides of the paper, online tests, reusing scrap paper)?			
23	How does your school promote reducing, reusing and rebuying in the community? (e.g., recycling drink containers used on school field trips, collecting clothing and food for local charities, holding locker clean out days and donating old school supplies/unclaimed lost items to students in lesser developed countries)?			
24	What percentage of school waste is: A. Recycled? B. Reused? C. Composted? D. Burned? E. Thrown in the landfill?			

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25	Who conducted this Solid Waste Inventory (e.g., Mrs. Frugal's eighth grade Practical Living classes with help from Mrs. Baker, cafeteria staff, Mr. G. Arbage, maintenance worker, and the county solid waste coordinator)?			Sixth Grade PL-06-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 PL-06-3.1.1 Students will identify how wants and needs influence consumer decisions. Seventh Grade PL-07-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 PL-07-3.1.1 Students will describe how wants and needs influence consumer decisions. Eighth Grade PL-08-3.1.4 Students will describe consumer actions (reuse, reduce, recycle) and explain how these actions impact the environment (e.g., conserving resources, reducing pollution, reducing solid waste, conserving energy). DOK 2 PL-08-3.1.1 Students will explain and give examples of wants and needs that influence consumer decisions. High School PL-HS-3.1.4 Students will compare consumer actions (reuse, reduce, recycle, choosing renewable energy sources, using biodegradable packaging materials, composting) and analyze how these actions impact the environment (e.g., conserving resources; reducing water, air, and land pollution; reducing solid waste; conserving energy). PL-HS-3.1.1 Students will explain ways to make responsible buying decisions in relation to wants (e.g., technology, name-brand clothing, jewelry, electronics) and needs (food, clothing, housing).